

## High Throughput Modeling of Post-Traumatic Stress Disorder

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Combat veterans, have higher instances of PTSD only about 7% of the US population will develop this pathology. The low ratio of individuals exposed to a traumatic event to individuals who develop PTSD (75%: 7%) highlights that most individuals can successfully cope with the emotional aftermath of stressful situations. Individuals suffering from PTSD seem to have a fundamental impairment in this stress coping ability, or the ability to progress past the event. It is common for people to report PTSD like symptoms in the following days or weeks after a traumatic event and is considered to be perfectly natural. It is not until these symptoms persist for more than a month before a diagnosis of PTSD can be made. Given the incidence of natural disasters, violent/sexual assaults, and other traumatic incidents in the United States, there is a great need to develop tools directed at studying PTSD. Preclinical modeling of PTSD can be achieved by using Pavlovian fear conditioning where a rat associates a mild foot shock with neutral tone. Details associated with a past traumatic can elicit a fearful reaction in PTSD, the tone previously paired with foot shock can elicit a fearful response in a rat, when not presented with a shock. The ability of an animal to disassociate the tone from the foot shock can be achieved by repeated exposure to the tone in the absence of the shock. After this repeated exposure to the tone the animal learns to “extinguish” the previous fearful memory of the footshock is very relevant to PTSD which is characterized by fearful memories that persist for an extended period of time. In the current work, we characterize a new apparatus for fear conditioning / extinction in rats that allows for the running of multiple animals paired with automated behavioral scoring.

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